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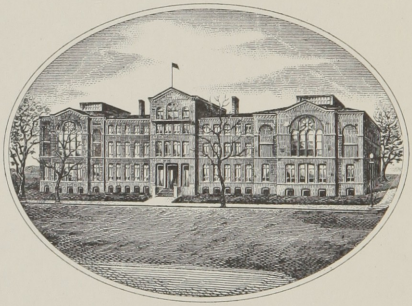

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U. S. Department of Health, Education, and Welfare

Public Health Service

Dr. John Thomson, Prof. of Surgery
from his sincere friend The Author

EXPERIMENTAL OBSERVATIONS

ON THE

OPERATION OF LITHOTOMY;

WITH

THE DESCRIPTION OF A

FASCIA OF THE PROSTATE GLAND,

WHICH APPEARS TO EXPLAIN ANATOMICALLY THE CAUSE OF URINAL INFILTRATIONS, AND CONSEQUENT DEATH.

By GRANVILLE SHARP PATTISON, Esq.
SURGEON.

[Written for the American Medical Recorder, published by Mr. James Webster, Philadelphia, Jan. 1820.]


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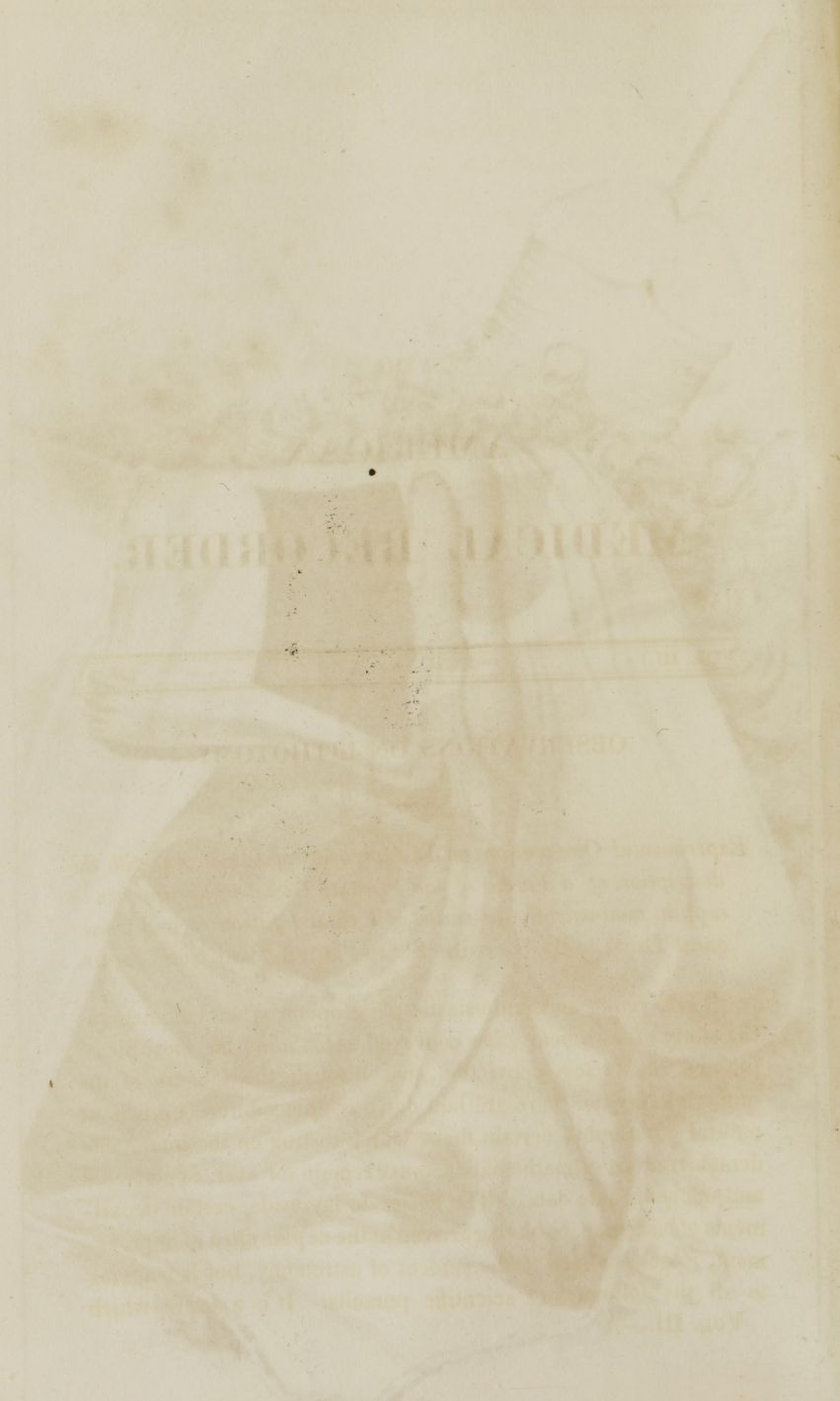


THE

AMERICAN

MEDICAL RECORDER.

VOL. III.] JANUARY, 1820. [NO. I.

OBSERVATIONS ON LITHOTOMY.

Experimental Observations on the Operation of Lithotomy, with the description of a Fascia of the Prostate Gland which appears to explain anatomically the cause of Urinal Infiltrations and consequent Death. By Granville Sharp Pattison, Esq. Surgeon, &c.

THE young and enthusiastic philosopher, when commencing the study of astronomy, has conveyed to his mind the most pleasing and satisfactory conviction, that through the labours of the immortal Newton there are laid down in this sublime branch of natural philosophy, certain facts, which resting on the immutable demonstrations of mathematics, must remain for ever, as perfected and unchangeable data. The desire to lay aside, certain departments of a science, as having arrived at the *ne plus ultra* of improvement, is not confined to the student of astronomy, but is common to all the followers of scientific pursuits. It is a desire which

originates from a two-fold principle,—a wish, to limit the extended field of our inquiries, in order that we may devote our undivided attention to those subjects which are allowed by all, to be yet in an imperfected state,—and from the gratification our minds receive by the contemplation of the fact, that through the labours of our fathers some parts of our science at least, have become perfected. It is a desire which is honourable, yet it is one which should only be indulged with the most guarded caution. Let the student never for a moment forget, that he whose splendid discoveries in astronomy, they now so much admire, never laid aside one part of his science as fixed and confirmed, until its truth was established, on a basis which it was impossible either to question or overturn.

If caution is necessary in guarding against the belief, that certain departments of mathematical science are incapable of further illustration or improvement, it is ten thousand-fold more so, in relation to the arts. We can in the former arrive at undoubted and unanswerable conclusions; in the latter these are never to be obtained. Operative surgery is much more an Art than a Science, and consequently the student cannot be too sceptical in believing, that any of its operations are so perfected by the labours of preceding generations, as to be incapable of improvement.

These observations, have been suggested to my mind from a recollection, that in relation to the operation of lithotomy, I began my professional career with the belief, that it had now arrived at a pitch of perfection, which no study nor investigation could possibly improve. Proceeding on this idea, I am aware that in my first operations, I not only operated improperly myself, but what is worse, that in my character of a Public Teacher, I inculcated with all the warmth and enthusiasm of youth, as a perfected operation, one which later observation has demonstrated to me as the most dangerous which can be performed. As a student I had remarked, that in almost all the cases where death had followed the operation, considerable difficulty had been experienced, and very considerable force required in extracting the stone. And from a short-sighted and boyish observation, I threw from my consideration the recollection of the largeness of the stones ex-

tracted, and the repeated divisions of the prostate which were required before these could even be brought away by force; and inferred that the single cause of death, in these cases, was the smallness of the wound of the gland, requiring that the stone should be brought through it forcibly by tearing the parts. There was a simple mode of avoiding tearing the parts, which in my opinion was the sole cause of death; this was not only to cut the prostate gland, but likewise to make a free division of the shoulder of the bladder. This I practised and taught as the perfected operation; an operation, which if boldly adopted, would be rarely if ever followed by the death of our patient.

The first patient on whom I operated for stone, was an infant of two years of age, and whether in this case, I divided the basis of the gland and shoulder of the bladder, or from the timidity attendant upon a first operation, was prevented putting these my principles into practice, it is impossible for me now to say. The stone was small, it was easily extracted, the child did well, and I then thought that I had done so, and conceived that there was to be deduced from this successful operation, one evidence as to the justness of my opinion, and the excellency of the operation. These pleasing contemplations were however soon interrupted. A second operation occurred, and its issue demonstrated to me, that the operation which I had before believed to be free from danger, was in truth one, which might even after its best performance terminate fatally.

The subject of the second operation was one of the most favourable for a successful termination. He was eight years of age, slightly emaciated from the disease, yet otherwise in the most perfect health. In this operation my self-command and coolness were undisturbed, and here most certainly, I did proceed upon my principles, and completely divided, not only the basis of the prostate gland, but likewise the shoulder of the bladder. Two stones were extracted, and the patient was removed from the table in two minutes and a half. As I left the apartment with my esteemed friend Dr. King; he shook me by the hand, and said, "Pattison, it is impossible that this patient can die." I then, most assuredly believed so, and would as soon have thought of being in fear for

my own life as for that of my patient. For the whole of that day he continued well, but on making my visit next morning at five o'clock, his appearance alarmed me. His countenance had a particular expression of anxiety, which is of all symptoms the most disagreeable after an operation; his pulse was quick and irritated, and his skin felt hot and feverish. He seemed displeased when questioned, and expressed a desire to be left quiet. When pressure was made on the belly, it did not appear to give him any uneasiness. I was encouraged by this absence of pain, and flattered myself that all the disagreeable symptoms might be explained as depending on the commencement of suppuration in the wound. He was however blooded as a precautionary measure. From the venesection he appeared to derive no benefit, and continued during the morning, very nearly in the same, with this difference, that every hour it became more and more difficult to get him to answer questions. Towards the evening he was again blooded, and at midnight a blister was applied over the lower part of the belly.

It is unnecessary to particularize farther the progress of this case; suffice it to say, that the insensibility gradually increased, and that on the morning of the third day, he was in a state very nearly resembling complete coma, in which he remained until the evening, when he expired.

The termination of this case, it may well be believed, amazed me; but this was not the only effect which it produced, it overthrew all my gratifying speculations, as to the operation being now a perfect one, and taught me, in the bitterness of disappointment, this most valuable lesson—The folly of taking hold only of the striking points of a subject, and from them, drawing strong and positive conclusions. I now felt satisfied that my views of the cause of death, occuring after lithotomy, had been by much too partial, and was brought in the true spirit of a child of science, to investigate anew, every part of the operation, and in comparing the symptoms which preceded death, with those I had observed in other instances, to attempt to give a rational solution of the cause of this event.

In reviewing the symptoms which preceded death, two things occurred to me as particularly worthy of notice: 1st, The absence

of positive symptoms of enterites. 2dly, The tendency to coma. I recollected that I had been much struck in observing in the only subject which I had seen opened, after death from the operation of lithotomy, that no vestige of inflammation, had been detected either in the peritonæum or viscera of the abdomen,—that the surgeon had in fact declared, that the patient had not died from inflammation. And further, I had heard teachers of surgery and old practioners remark, that it was very difficult in many cases to account for death after this operation, as enteritic inflammation, although sometimes demonstrated by dissection after death, was much more frequently absent. Again, the symptom of coma was one, which was very frequently found present in cases where urine has from rupture of the urethra been effused into the perinæum. I had, in fact, some months before performing this operation, attended a patient who had died from such an effusion; and in reviewing in my mind the symptoms which there manifested themselves, and comparing them with those of my young stone patient, I was particularly struck, with the near resemblance which characterized the symptoms of the two cases, and began to suspect that an effusion of urine into the cellular texture surrounding the bladder, might have been the cause which produced the death of my lithotomy patient.

These considerations, induced me in conducting the dissection, to be much more minute in my examination of the parts than was customary. When the belly was opened, and no marks of inflammation of either the pelvic or abdominal viscera appeared, I was not satisfied; I did not leap over the difficulty, with the unphilosophical assertion with which I had frequently heard others solace their minds,—that the death did not arise from inflammation, but from some inexplicable sympathy betwixt the brain and bladder, by which a simple irritation of the latter could overpower the actions of the former.* My attention was particularly directed to the perinæum, as I was suspicious from the coma which preceded

* This sympathetic connection betwixt brain and bladder, has been much talked of. My excellent friend Dr. Physick informs me, that the late Mr. Cruickshank of London was of this opinion, and was in the habit of stating in his lectures a case, where, from simply touching the prostate gland by intro-

the dissolution, that effusion of urine into the cellular structure in perinæum might account for the death. Upon separating the bladder from the rectum, it was evident that here, a morbid change had taken place. There was considerable matting and thickening of the parts, and collected betwixt the *bas-fond* of the bladder and vesiculæ seminales, there were about two drachms of pus.

From this dissection I obtained considerable information. I had a demonstration, that although no character of inflammation was detected upon the abdominal aspect of the pelvic vicera, yet still that inflammation might exist, and that, in this case, it had unquestionably produced the death of the patient, from its having passed into its suppurative stage, betwixt the bladder and the rectum. And again, I could hardly doubt, from the striking analogy in the symptoms of this case and the one of urinal effusion, that the infiltration of urine betwixt the bladder and rectum, and not the wound of the prostate, had acted as the exciting cause of the inflammation. But, although I was satisfied of these facts, still I could not believe that the operation was defective. The only truth inforced upon my mind was the conviction, that the operation of lithotomy, even when performed in the most judicious manner, was one of great danger. I was satisfied that the risk arose from the infiltration of urine, but still I conceived, that the freer the wound of the bladder, the more readily would the urine be allowed to flow out, and consequently, that there would be less danger of its infiltration into the surrounding cellular subtance.

From this reasoning I was left for nearly two years in a state of fearful apprehension as to the dangers of lithotomy. Had I been

ducing the catheter, his patient dropped down dead at his feet. I can easily believe this, but I do not see that it is to be received as a positive demonstration of such an intimate sympathetic connection. Many men have dropped down dead whilst swallowing a glass of wine, and as we would be ridiculed were we to attempt to explain the death of such, by an inexplicable connection betwixt gullet and brain; so, I conceive, we equally expose ourselves to censure, by adopting such nonsensical, unphilosophical jargon, for the explanation of the death in the former instance. If we cannot explain any of the vital phenomena in relation to particular states, let us modestly confess our ignorance, and not blunt the edge of our inquiries, by contenting ourselves with talking of *inexplicable sympathies.*

called upon, I should certainly have proceeded to its performance, with more dread of the result, than of that of any other operation in surgery. But fortunately, I was not put to the trial, no patient having consulted me for this period of time who required the operation.

During this season of uncertainty, opportunities were afforded me of witnessing the operation as performed by my brethern, and in three cases of making dissection. The symptoms which preceded death, in all of these, bore a considerable resemblance to those which had occurred in my own case, and in all, pus was found betwixt the bladder and the rectum.

Thus from observation and experience, my belief as to the infiltration of urine being the cause of death, became every day more and more confirmed. But continuing to dissect the parts in the healthy state in the usual manner, I was not led to a solution of the anatomical reason for such infiltration.

About this time I was much struck with a conversation, which I had with my friend Mr.————,* a man who deservedly stands at the very head of his profession in Great Britain. As nearly as I recollect his words, on the propriety of making small wounds for the extraction of calculi from the bladder, they were as follows:—"The longer I practice, the more am I convinced that the smaller the wound, made in operating for lithotomy, the better. I may not live, but you probably will, to see the neglected and despised Marian method, (*apparatus major*,) under some slight modification revived. I do not conceive that the danger of a larger wound, arises from the division of a membranous part, but from the risque that in making such, some large vessel will be wounded, and much blood lost. Hæmorrhage is, I conceive, the cause of death in most of the operations which terminate fatally; at least every patient of mine who has died, has during the operation lost a very great quantity of blood.†"

* As the conversation was confidential, I am unwilling to mention the name.

† It is a curious fact that M. Dupuytren of the Hotel Dieu of Paris, who stands in the first rank of French surgeons, should in his Clinique, teach a similar doctrine, as to the cause of death. He there decidedly says, "That the loss of blood, not inflammation, is the cause of death."

I shall have occasion to refer to this opinion hereafter; for the present I would, in continuing the account of the diary of my thoughts in relation to the operation of lithotomy, merely observe; that at this time, as I could not agree with this celebrated surgeon as to the cause of death, so I could not concur with him as to the propriety of small wounds. The only effect which the observation had, was impressing more and more on my mind, the dangers of the operation.

The excellent memoir of the venerable father of Italian surgery, professor Scarpa, was what first forced me to change the usual method of examining the anatomy of the parts concerned in the operation of lithotomy. By doing so I was enabled to demonstrate anatomically, the reason why large wounds of the prostate, should be more dangerous than small ones.

I was recovering from an attack of typhus fever, when the above memoir was brought me as something new, by Mr. Harry Rainy, an intelligent surgeon in Glasgow. I read it carefully, and was much struck with its contents. It agreed in asserting with Mr.————, that there was great danger in making free divisions of the prostate gland and shoulder of the bladder. But urinal effusion, the cause given by the Italian professor, as explanatory of the danger, was more consonant to my notions than the one adduced by my London friend. In all the dissections which I had previously made of those who had perished from the operation, I had invariably found suppurations betwixt the bladder and rectum, which had unquestionably been produced from the infiltration of urine. But I did not conceive that he had established the fact, that such infiltrations were dependent on a large wound of the bladder; a dogmatical assertion unsupported by any explanation of the reason, was, I conceived, not to be taken on a point of such vital importance.

The question,—is it possible that there can be any undiscovered connections of the basis of the prostate with the neighbouring parts, which can explain the reason why large wounds are more apt to be followed by urinal infiltrations than small ones? was now forcibly suggested to my mind. If such are to be found, we have a rational and philosophical demonstration of the justness of Scarpa's reasonings. If there are none, there can then be no physi-

cal reason, why urine should be more apt to infiltrate into the cellular texture surrounding the bladder, in a large than in a small wound. To satisfy my mind on this momentous question, the first day I was able to walk to my dissecting room, I went there, and dissected the parts after a new method, one, which enabled me to discover a new fascia,—a fascia which, from its connection, explained the justness of Scarpa's observation, and taught me, at the same time, the fearful consequences, which were naturally to be expected from the adoption of the operation I had heretofore advocated.

In writing an essay for a periodical publication, it is desirable to abridge into the shortest possible limits, the doctrines to which we wish to call the attention of the profession. I shall, therefore, in describing the anatomy of the parts concerned in the operation of lithotomy, take it for granted, that those for whom these observations are intended, are acquainted with the structure of these parts as generally demonstrated, and shall only explain particularly, this new fascia, which I have named *The fascia of the prostate gland.* To render my account perspicuous, it will, however, be necessary to run over very shortly the different parts which require to be divided, in performing the lateral operation.

When the skin and cellular substance are removed from the perinæum, we bring into view a pretty strong layer of condensed cellular substance, which is known under the name of the perinæal fascia. It completely covers and conceals all those parts which fill up the trianglar space which is formed under the arch of the pubis. Upon cutting away this fascia, the muscles of the perinæum are exposed; not lying isolated and separated from each other, as one would be apt to believe, from the descriptions of many anatomists, but connected and united by a firm tough cellular texture. In the median line of this triangular space, the bulb of the urethra is placed, its substance is however concealed, and covered by the acceleratores urinæ muscles, which passing off towards the pubis obliquely with their tendinous fibres, finally become lost in the crura of the corpora cavernosa penis, immediately above the insertions of the erectores penis. Coccygeally the bulb is secured in the middle line by the pubal insertion of the sphincter ani, the other insertion of this muscle becoming fixed

into the tip of the os coccygis. Arising from the tuberosities of the ischii, we have the erectores penis muscles. They take as their guides the rami of the ischii, and are inserted into the crura of the cavernous bodies of the penis which arise from them. The erectores at their origin, are necessarily not only separated to a considerable distance from each other, but are likewise thrown off obliquely from the bulb of the urethra, which I have before described as lying in the middle line of the perinæum. As the rami of the ischii approximate, these muscles come for a considerable distance before they terminate, to run along and connect themselves with the lateral aspects of the acceleratores urinæ. The spaces left below the points where the erectores muscles touch the acceleratores, is traversed by the transverse muscles of the perinæum; which arising from the tuberosities of the ischii, run directly across, to be inserted into the backmost points of the bulb of the urethra.

In carrying the description of the parts thus far, I have considered the perinæum on both sides; but in proceeding, it may be advisable to speak only of one. I describe the left, as it is on this side that we operate for stone; it may be remarked, that the structure is on both exactly alike. Placed under the transversalis perinæi muscle, and occupying all of the triangular space which it crosses, there is a pretty firm layer of fascia which requires to be divided. When it is dissected away, the oblique descending fibres of the lavator ani are exposed, not only covering and concealing the body of the prostate gland, but likewise hiding the membranous part of the urethra, which passing out from the back part of the corpus spongiosum, is situated interior and a little superior to the bulb of that body.

In adopting the usual method for dissecting these parts, little more than what I have thus generally described can be seen. The fascia of the prostate lies so deep, that by such a procedure it cannot possibly be detected. To obtain a view of this important part, it is necessary, after having exposed, by the dissection I have described, the lavator ani muscle, that we on the left side detach the corpus cavernosum penis, covered by its eretor from the rami of the ischium and pubis. So soon as this is done, we are next to divide carefully the symphisis pubis, taking care when we

do this, to avoid cutting too far down. The symphisis being cut, and the abdominal muscles divided without injury of the peritonæum obliquely upwards, in a line betwixt the umbilicus and ilial spine, we separate forcibly to the distance of about an inch and a half the symphisis pubis. By this separation the deep-seated parts are completely exposed. Upon making a transverse division of the lavator ani, a small quantity of cellular substance is exposed, which is, together with the lavator ani, to be carefully dissected away. When this is accomplished, the prostate fascia is exposed; and if we now carry the finger down betwixt its pelvic aspect and the shoulder of the bladder, and remove the loose cellular texture which separates these, we are enabled to obtain a most beautiful demonstration of its importance, in relation to the operation for the stone.

The prostate fascia, when superficially looked at, would appear to take its origin from the inner margins of the rami of the os ischium and pubis. If we, however, come to examine it more attentively, we may remark that, although it has here a connection with the bone, that here it does not terminate, but that, in fact, it is continuous with the aponeurosis which covers the obturator internus muscle. The best description, perhaps, which can be given of it, would be to state, that the fascia which covers the internal obturator muscle, having reached the rami of the ischium and pubis, forms there a connection with the inner margins of these processes; and that, from this it runs down, and is at last lost by becoming inserted into the basis of the prostate, and into the rectum, where lying below, and exterior to the gland. From this description the two following important facts are to be observed:

1st, That the prostate fascia separates the perinæum from the cavity of the pelvis.

2dly, That, from the manner in which the fascia passes from the rami of the ischium and pubis, to its insertion, that a triangular space must be formed betwixt its pelvic aspect and the shoulder of the bladder; the apex of the triangle being formed by the union of the fascia with the basis of the gland, and the base by the lateral boundary of the pelvis.

From these anatomical facts, many most important practical deductions may be drawn. If we do not divide the base of

the prostate gland in performing the operation of lithotomy, two great objects are gained. We have placed betwixt us and the pelvis, a barrier, composed of a substance, of all others, the least susceptible of an inflammatory action, and thus, allowing that high inflammation should supervene in the wound, after the operation, it is more than probable, that its progress inwards, to the viscera of the pelvis, may be guarded against. But there is another, and a much more important purpose answered, by our allowing the base of the gland to remain uncut,—the infiltration of urine betwixt the bladder and rectum, is rendered physically impossible, so long as this is entire.

If I have, in the first part of my essay, proven by unquestionable facts, that in almost every case of death after lithotomy, this event occurs from infiltrated urine, producing gangrenous suppuration, betwixt the bladder and rectum; surely, upon the safety of this fascia, rests the safety of our patient. I would not, however, allow the asserted fact, that death occurs from urinal effusion, to rest on my own assertions. Does not the experience of that great surgeon Scarpa, corroborate and confirm them? Does not Mr. John Bell, although advocating a free incision of the parts, unconsciously demonstrate the ruinous consequences which arise from such, and prove in the strongest manner, the truth of my observations?* I am aware, that there are many surgeons who declare, that they have made dissections of those who died from the operation, and never saw such infiltrations. But I would ask them, how were such dissections conducted? Were they performed with the view of discovering infiltration? I am persuaded that they were not:—that inflammations of the viscera were alone looked for; and that these, when present, satisfied them, and when absent, that they pleased their minds by talking of inexplicable sympathies.†

* Mr. Bell is most decided in asserting that the inflammation which produces death, arises from urinal infiltration. It is, indeed, the generally received opinion.

† The last subject I dissected after death from lithotomy, was one which was accidentally brought into my dissecting room, after it had been previously examined in the customary method in the Royal Infirmary of Glasgow. The surgeon there, could find nothing wrong; and lectured to the pupils for half an

If we can demonstrate, from the anatomical structure of the parts, that urinal infiltrations behind the bladder, cannot possibly occur, so long as the base of the prostate gland remains uncut, we can, from the same source, equally forcibly prove, that upon its division, there is opened a free channel for the urine to pass down and effuse itself betwixt the rectum and bladder. It will be recollected, that in the description of the prostate fascia, it was stated, that there is formed betwixt its pelvic aspect and the shoulder of the bladder, a triangular space, which is filled up with a very loose cellular texture. Bearing this fact in our minds, we can easily understand, that so soon as we cut the basis of the gland and shoulder of the bladder as connected with it, that we come necessarily to make a horizontal section of the triangular space above described. When this is opened, it is obvious, that as the urine now flows from the bladder through the external wound, that it must necessarily pass across this space, and from the loose texture of the cellular substance which occupies it, we have a clear explanation of the manner in which the infiltrations of the urine occur. In fact, we have a demonstration, that the urine shall find less difficulty in effusing itself around the bladder, than in passing through the external wound.

I should hope fromt he description of the prostate fascia which I have given, and from the reasons for urinal infiltrations which I have drawn from this, that every surgeon whose mind is qualified to think upon the subject, must have given his hearty assent to my two-fold position; viz. That the base of the gland remaining undivided, urine cannot be effused; and that when cut, its infiltration can scarcely be prevented. But as general peritonæal inflammation, is frequently discovered on opening the bodies of those who die after the operation of lithotomy, some explanation of the cause of this may be expected.

If we only recollect the connections which exist betwixt the bladder and peritonæum, and again those which exist betwixt

hour in the *old strain*, about how unaccountable the death was—that it was not from the operation, &c. &c. &c. There was no cause for wonder; when I separated the bladder from the rectum, I at once discovered the cause of death: urinal infiltration having produced there extensive gangrenous suppurations.

this membrane and the prostate fascia, we have an easy solution of the apparent difficulty. All the space betwixt the pelvic aspect of the fascia, and the perinæal surface of the peritonæum is filled up with the loose cellular substance, of which we have already spoken; with that substance, into which, the urine is by the division of the base of the prostate gland allowed to flow, and in which the inflammation is produced. If then the inflammation, by passing into gangrenous suppurations, does not immediately overpower the *vis vitæ*, it must pass upwards, towards the peritonæum, and communicate an inflammatory disposition to it:—a disposition of which we know it is very susceptible, and one, which when it receives, it spreads with rapidity.

Having thus established our doctrines on the fixed and unchangeable data which the anatomical structure of the parts affords us; we would come now to strengthen it by a short review of the experience of other eminent surgeons. My London friend, and M. Dupuytren, two men who we may perhaps, say with truth, have had more practice in this operation than any other of the European surgeons, have stated that the patients who die after the operation, die from hæmorrhage. This is most assuredly not the fact. The blood of the arteries of the perinæum is not more essential to life than that contained in any of the other arterial branches. Yet do we ever see the same quantity of blood lost in this operation, which we are in the habit of witnessing in wounds occurring in the field of battle, or from accident? I am satisfied that we never do. We are called to a patient who has cut the radial or some other large artery; we find the apartment deluged with blood, and the person almost lifeless from its loss; we tie the vessel, and our patient recovers without any disagreeable symptom manifesting itself. Can we credit then, the monstrous assertion, that the few pounds of blood which may be lost under the operation for stone is the cause of the fatal termination? I am astonished that two men, who deservedly stand in the very first rank of their profession, should have allowed their minds to remain, for a moment, satisfied with such an explanation. We can, I conceive, from the anatomy of the prostate fascia, explain the reason why the patients are frequently lost, when the bleeding is considerable. The flowing of

blood in quantity during the operation, demonstrates that our incision into the bladder is large. We divide this fascia, and lose our patients from urinal infiltrations, not from hæmorrhage.

That excellent and enlightened surgeon, Dr. Physick, a man, who by his talents and professional enthusiasm, has deservedly raised himself, to the very highest pinnacle of chirurgical eminence, has observed to me, that for a considerable number of years back, he has been in the habit of introducing, from the wound into the bladder, a piece of a gum catheter, which he allows to remain, and that the success of his operations had been much increased by the introduction of this instrument. The superiority of success attending those operations where the catheter was introduced, over those where it was not employed, is a strong argument, in proof of the justice of my observations. The catheter was employed by the Doctor, without his being aware of the particular connections of the basis of the prostate gland; it serves as a guide to make the urine pass by the external wound, and thus tends to prevent the effusion of urine, betwixt the bladder and the surrounding parts.

The frequent deaths which occur after the operation of lithotomy, as performed by a free division of the parts, has induced some of the most eminent European surgeons, to discontinue the lateral, and in its stead revive the high operation; a fact which certainly argues, that in operations so performed there is a radical fault; one which we conceive we have explained from the demonstration of the connections of the prostate fascia with the neighbouring parts.

It is unnecessary to bring forward further evidence, in support of the correctness of my opinions, as to what gives rise to the danger, in lithotomy. I feel satisfied that I have, from the practical observations of others, as well as from my own, established the fact, that urinal infiltrations, from the irritation, inflammation and gangrenous suppurations, which they produce, are in ninety-nine cases out of the hundred, the cause of death. I feel equally confident from the situation and connection of the prostate fascia, that unless the base of that gland is divided such infiltrations cannot occur; and lastly, I conceive, I am justified in the conclusion, that if we perform an operation, in which we cannot cut the base

of the gland, that we perform one, comparatively speaking, freed from danger.

Professor Scarpa, although ignorant of the existence of the fascia of the prostate, has from the lessons of an extended practice, and acute observation, been taught the dangers of free divisions of the gland. This aged surgeon, who although now in the wane of life, retains all the vigour and enthusiasm of youth, has in the memoir which he has lately published, "On the Cutting Gorget of Hawkins," proposed an improvement on that instrument, which secures the base of the prostate from injury. He has correctly remarked, that the orifice of the bladder uncut, dilates without difficulty to the diameter of five lines; that the body of the prostate gland may with safety be cut to the depth of five lines more, so as to afford us a wound which from an almost spontaneous dilatation, makes an opening of nearly ten lines in diameter. And as this will with very moderate dilating force, yield eight lines more, we have a wound through which we can with safety to our patient, extract a calculus, the smallest diameter of which does not exceed eighteen lines, such as those of three ounces and a half in weight. The same author remarks, that as the body of the gland is considerably smaller in children, that our incision of the gland in them should not go beyond two lines.

The operation I would recommend has the same intention, as the one which Scarpa advises: I would use an instrument with which we could only cut the prostate to a determinate extent. For many reasons I prefer it to the one, he directs to be executed with Hawkins' gorget. It possesses all the advantages which are secured in his operation, whilst it is freed from all the dangers attendant on the use of the gorget.

Our patient being secured in the usual way, and a curved staff introduced into the bladder, we should commence our external wound a little to the left side of the raphe, about an inch above the anus. This should be continued down boldly from three to four inches, in a line which runs betwixt the tuber ischii and the anus, inclining it considerably towards the former. Having by this external incision divided the skin, cellular substance, and perinæal fascia, we are next to make a second incision in the same

line, beginning it by cutting betwixt the erector penis and accelerator urinæ muscles, and dividing, as we go backward, freely the transversalis perinæi. There is a great mistake committed by many surgeons, in making this the second incision; they cut deeply betwixt the erector penis and accelerator urinæ, but having done this, they are satisfied, and leave the ischial division of the wound untouched. Two very strong objections may be urged against this proceeding:—1st, The transverse muscle of the perinæum, remains entire, and will be apt, by its contraction, to increase the difficulties of extracting the stone. 2dly, The opening from the external wound into the bladder, instead of being depending, as it is, when the division of the parts is continued freely backwards, will be either straight, or it may even be placed lower, than the one through which the urine has to flow. It is customary after these two incisions are executed, for the surgeon, to cut upon the membranous part of the urethra, to open it, and run his gorget along the staff. I would, however, recommend, that before we look for the membranous part of the urethra, we convey our left finger into the wound, and having pushed the prostate gland, covered by the lavator ani fibres, to the right side, that we should introduce upon our right fore finger the scalpel, and divide from behind outwards, that muscle, both where covering the prostate, and likewise where lying over the membranous part of the urethra. I am persuaded, that neglecting to do this, is one of the principal causes of the difficulty, which is frequently experienced, in laying hold of the stone, and of bringing it through the opening which we have made in the bladder. Indeed, it is evident, that if our division of the gland be executed whilst the lavator muscle is uncut, that its fibres must remain untouched, unless we make a perfect division of the body of the gland and shoulder of the bladder. It is needless to prove, that its remaining entire, will operate powerfully against the extraction of the stone.

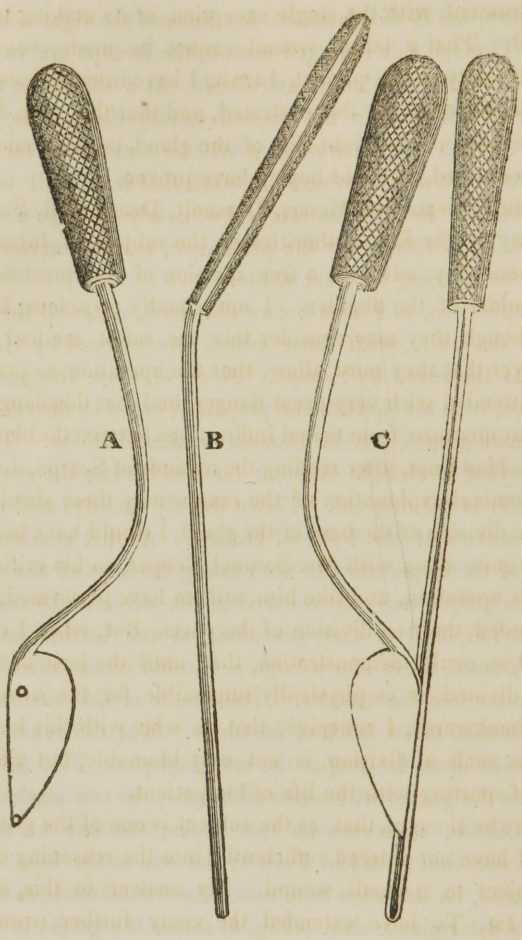
When we have, by the division of the lavator ani muscle, exposed the membranous part of the urethra, we are to open it where joined with the apex of the prostate gland, and through this opening, carry the straight director B into the bladder. This step of the operation having been completed, the curved staff may be with-

drawn, and examination made for the stone with the straight one; assured, from touching this, that our instrument is in the bladder, we are now, having grasped the handle of our staff firmly with the left hand, and given its groove the proper angle of lateralization, to carry with it, the prostate and membranous part of the urethra towards the right ischium. The two beaks of the gorget A are, whilst the instrument is in this situation, to be introduced into its groove, and along it, pushed into the bladder. When the incision of the prostate gland is thus accomplished, our gorget is carefully to be withdrawn, and the staff allowed to remain as a director for the forceps. These being introduced, we may open the blades gently in the axis of the wound, so as to make the dilatation of the prostate before we attempt to extract the calculus. I should here, however, wish it to be particularly understood, that I by no means advocate a dilatation, which might produce a laceration of the parts. We know from their structure, that they are capable of very considerable separation even from a moderate force. It is only such that I would recommend. The stone is now to be grasped, and an attempt made to bring it through the wound; but should it be found, in making this, that more force will be required than is consistent with the safety of the parts, our finger may be conducted along the forceps into the bladder, in order that we may ascertain, whether the calculus is held, according to its longest or shortest diameter. If it is in the former position, with our finger we may turn it, and having it now more favourably situated, again attempt its extraction. But should we either at first from examination, or afterwards, from the turning be assured, that although held by its shortest diameter, still it cannot be brought out without using violence, the blades of the forceps should be opened, and the stone allowed to drop again into the bladder. The finger being carried into the wound, the forceps are to be withdrawn, and an enlargement made of it in the following manner: Using the finger as a director, we carry the divided prostate with it to the left side, and then convey along its right aspect a common straight blunt pointed bistoury, with which we are to cut in the proper angle of lateralization, the body of the prostate upon that side. This must be executed with caution,

taking care, not to divide above five lines of the right side of the gland. Through this enlarged wound, the forceps are to be re-introduced, and the calculus extracted. As a stone, the shortest diameter of which does not exceed twenty-eight lines, can be brought through such a wound, it will be a rare case for a surgeon to meet with one where he shall find it difficult to finish the operation. In fact, the removal of nearly as large a stone as it is possible to extract by the perinæum, may be accomplished through the opening we have made.

This operation, as I have before observed, unites all the advantages of the knife, with those which are secured by Hawkins' gorget, as improved by Scarpa. None of those dangers which have been, with much truth and propriety, urged against the use of the common gorget, can be brought against this one. The idea of employing a straight director for conducting the gorget into the bladder is not original. I have merely modified and changed the instruments of Mr. Peile of Dublin. As that gentleman had no idea of the importance of not cutting the base of the prostate gland, his gorget was only secured in his director by one beak, placed at its point, so that, according to the inclination of the surgeon's hand, there was a large or a small wound made by running it home into the bladder. The handle of his instrument was placed parallel to the back of its blade. The difference in mine will be seen upon looking at the marginal plate, Fig. A,* which represents the gorget with a curved handle; the two marked points upon its blade, represent its two beaks; the one at the apex it has in common with Mr. Peile's; the one at the base is peculiar to mine; its intention is to make the wound made in the prostate, of a determinate size. Fig. C shows the gorget in connection with the director B. The advantages of giving a curve to the handle will be shown by this Fig., as well as the manner in which the beaks secure the blade, and renders it impossible for

* The instruments are here represented, for convenience reduced. The gorget from the lip to the end of the handle, measures nine inches. The grooved part of the director measures six inches, the handle four inches. These instruments were made by that very intelligent cutler, Mr. Browne, of Philadelphia.



more than a certain number of lines of the prostate to be divided. Of course, it is necessary to be possessed of a series of these gorgets: the breadth of the smallest size, when placed in the director, being two lines; the largest five and a half: to be used on patients at the different ages.

I would refer the reader to Mr. John Bell's account of the dangers of the gorget, all of which he will observe, are obviated by

this instrument, with the single exception, of its making too small a wound. That a larger wound cannot be made, consistently with the safety of the patient, I trust, I have from the anatomy of the parts, satisfactorily demonstrated, and that this may, by making a division of the right side of the gland, be with safety sufficiently enlarged, I should hope I have proven.

I am fully aware that Messrs. Dessault, Dease, Bell, S. Cooper, and many of the first authorities on the subject of lithotomy, of the present day, advocate a free division of the prostate gland, and shoulder of the bladder. I am equally conscious, however, that although they may consider this the safest method of operating, yet that they must allow, that the operation, so performed, is one attended with very great danger, and that this danger arises in a great measure, from urinal infiltrations betwixt the bladder and rectum. Had I not, after reading the memoir of Scarpa, discovered an anatomical explanation of the reason why these should occur, after the division of the base of the gland, I would have been ready to have gone along with Mr. Samuel Cooper, in his criticisms on Scarpa's operation, and like him, still to have performed, and recommended, the free division of the parts. But, when I can bring forward an ocular demonstration, that, until the base of the prostate is divided, it is physically impossible for the urine, to infiltrate backwards, I conceive, that he who with this knowledge performs such a division, is not only blamable, but that he is guilty of sporting with the life of his patient.

It may be thought, that, as the subject is one of the greatest interest, I have not entered sufficiently into the reasoning of those, who object to a small wound. My answer to this, is threefold. 1st, To have extended the essay further, would have been to encroach, too much, on the pages of this valuable journal; 2d, I propose to bring the subject, again in a short time, before the public, in my work on the Surgical Anatomy of the Trunk; and 3dly, That the simple fact of the existence of the prostate fascia, is a sufficient answer to every objection, which may be adduced, against the propriety of making a small opening into the bladder.

Since coming to this country, there has been a good deal of

talk, on the subject of the prostate fascia, and there has originated, from some source or other two reports.

1st, That the prostate fascia had no existence, that it was a mere fancy.

2dly, That it was no discovery.

In answer to the first assertion, I would simply state, that I have demonstrated it to some of the first anatomists of Europe, and that they have been perfectly convinced of its reality and have believed it a discovery. I have dissected it, in this city, in the presence of Drs. Physick, Eberle, and M'Clellan, who have all without hesitation, acknowledged its existence. I have since demonstrated it, before Drs. Parish and Hartshorne, who have expressed equally strongly, the conviction of its presence. With this confirmation of my own assertion, I would consider it idle, to reason, with those who talk about "*making fasciæ*," or those, who deny that name, to all such membranes as do not resist the utmost efforts of the nail-armed finger, to pass through them. It may be named, fascia, aponeurosis, condensed membrane, or any name the *curious* may desire; still it remains as a boundary, betwixt pelvis and perinæum; still it retains all that importance, which I have attached to its existence.

One of my friends was rather unfortunate in the discovery he thought he had made, that this fascia, had been described by Mr. Collies of Dublin, as the passage in that author, in which he conceived the prostate fascia was mentioned, referred to another,—a fascia universally known and demonstrated by anatomists. But although in the passage alluded to, Mr. Collies says nothing of the fascia, still I believe, from an attentive perusal of the work, that, that anatomist has seen it. He however only saw it, and was neither aware of its connections, its importance, or its uses. If any credit is due to me for calling the attention of the profession to the connections of the prostate fascia, this will remain uninfluenced either by the negative or affirmative answer to the question; did Mr. Collies ever see it?* The fascia he describes,

* That Mr. Collies is at all events, ignorant of the importance of the fascia, must appear when it is observed, that in speaking of the operation, he recommends a division both of the prostate gland, and shoulder of the bladder.

he states, is ultimately lost on the body of the bladder; were this the case with the one I call prostate fascia, its division along with the basis of the prostate, would have no effect on urinal infiltrations. The only claim I will make, and in this, I am confident I will be supported, is, that until the present no rational explanation has been given of the manner, in which the urine is effused, and consequently, that no operation has been philosophically proposed to prevent it. That I am supported in this claim, will, I trust, be allowed by the following quotation, from a paper, published by Mr. S. Cooper, in the Transactions of the Medical Chirurgical Society; a man who is perhaps better acquainted with the writings of ancient and modern surgeons, than any other in Great Britain. There having been no reasons drawn from anatomy, in support of the assertion, that large wounds are more apt to be followed by urinal infiltrations, than small ones, with the majority of the best surgeons, he discredits it, and adds, " Indeed, whenever they do happen, I believe, they proceed from a totally different cause, viz. from the incision of the skin being too small, and too high up, and from the axis of the internal part of the incision, not corresponding with that of the external wound. Hence the urine does not readily find its way outward, and some of it passes into the cellular substance." If my brethren allow that I have demonstrated the fallacy of this most erroneous and dangerous sentiment, I shall consider myself richly rewarded.

DESCRIPTION OF THE PLATES.

Plate I.

Fig. 1. a, sound introduced into the urethra. b, penis. c, scrotum. d d d, pubis of right side, separated from opposite bone. e e e, rami of the pubis and ischium of left side. f f, corpus cavernosum of same side, detached from these processes and turned up. g, prostate gland. h, sound, exposed as passing through the canal of the urethra, where formed in substance of prostate. i i i, extent of the incision of the prostate. k, its termination be-

fore reaching l, the basis of the gland. m m m, prostate fascia passing from base of gland to the inner margins of the rami of pubis and ischium, and thus forming a septum of separation betwixt the perinæum and pelvis. n n, some of the remaining fibres of lavator ani muscle, those nearer the pubis having been removed for the purpose of exposing the prostate fascia. o, membranous part of the urethra. p p, rectum covered and concealed by fibres of lavator ani. q q, prostate fascia running under lavator ani muscle, to be inserted into rectum.

Fig. 2. 1, penis. 2, membranous part of the urethra. 3, prostate gland. 4, shoulder of the bladder. 5 5, prostate fascia connected with base of gland. 6, triangular space formed betwixt its pelvic aspect and the shoulder of the bladder. In this sketch the triangular space is shown lower than the line of our incision of the prostate. It must, however, be evident, that a similar triangular space will be formed betwixt the bladder and fascia up to the pubal connection of the former.

Plate II.

The drawing of this engraving, was taken from the same dissection, as the one designed in the first figure of Plate I. It only differs from it, in having the incision extend through the base of the prostate gland, a a, prostate gland divided through b b, its basis c c c, prostate fascia necessarily cut, and triangular space d, opened. The dotted line from the cavity of the bladder, marks the course which the urine must follow, in passing out at the external wound. It will be observed, that it traverses the triangular space d.